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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,015	12/29/2004	Hideki Kawamura	36856.1313	2628

54066 7590 05/08/2006

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EXAMINER	
TAKAOKA, DEAN O	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 05/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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10/520,015	12/29/2004	Hideki Kawamura	36856.1313	2628

7590 04/21/2006

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TAKAOKA, DEAN O	
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Office Action Summary	Application No. 10/520,015	Applicant(s) KAWAMURA, HIDEKI	
	Examiner Dean O. Takaoka	Art Unit 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-20 and 22-28* is/are rejected.

7)☒ Claim(s) *21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 December 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/29/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "transmitting filter use second harmonic waves" and the "receiving filter use fundamental waves" (claim 21) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The transmit and receiving filter are shown but the filters using the respective second harmonic and fundamental waves are not shown.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15 – 17, 22 – 24, 26 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujino et al. (U.S. Patent No. 6,897,740).

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim 15:

Fujino et al shows branching filter (best shown in Fig. 5 and 7 – 9) comprising a transmitting filter (35); a receiving filter (36); where piezoelectric thin film resonators include at least one piezoelectric thin film sandwiched between at least one pair of opposed electrodes are arranged in a ladder configuration on an opening of a substrate

(ladder shown in Fig. 5 and resonator in Figs. 10, 11, 13, 16 et al.); where the piezoelectric thin film resonators defining the transmitting filter and receiving filter have a different structure from each other (Tx filter in Figs. 10, 11, 13; Rx filter in Fig. 16 – col. 8, lines 1-2 ,16 and 62).

Claims 16 and 17:

Where the piezoelectric thin film defining the transmit and receive filters have different piezoelectric films (where the piezoelectric film 110 of the Tx filter is ZnO, AlN et al. – col. 8, lines 10-12 and where the piezoelectric film 217 of the Rx filter is ZnO – col. 8, line 64).

Claims 22 – 24:

Where the piezoelectric film defining the Tx filter and the piezoelectric film of the Rx filter comprise a different insulating film on the opening or recess (where the Tx filter comprises single 106 or dual 313, 314 layer insulation film/s of SiO2 or SiO2/Al2O3 – col. 8, line 5 or SiO2 and AlN lines 27-29; and where the Rx filter has dual 213, 214 insulation films of Al2O3 and SiO2 – col. 8, lines 60-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 18 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujino et al. in view of Bradley (U.S. Patent No. 6,262,637).

Fujino et al. teaches the branching filter above comprising transmitting and receiving filters formed of piezoelectrics having different structures but is silent where the materials of the electrodes are different between the piezoelectric resonators defining the Tx and Rx filters; where the acoustic impedance of the materials of the electrodes is different defining the Tx and Rx filters; or where the frequency of the passband of the Rx filter is higher than the pasband of the Tx filter and the acoustic impedance of the electrodes of the Rx filter is higher than the acoustic impedance of the electrodes of the Tx filter.

Bradley teaches a most nearly identical branching filter comprising transmitting and receiving filters formed of piezoelectrics, further having different electrode materials (col. 14, lines 40-45; where the series and shunt electrodes are different, thus at least where the series or shunt electrodes of the Tx filter has different material than the shunt or series electrodes of the Rx filter); inherently having different impedances (i.e. different materials of the series and shunt electrodes); and where the Rx frequency is higher than the Tx (Bradley – Fig. 2) and where the acoustic impedance of the materials of the electrodes in the Rx filter is higher than the Tx filter (i.e. different materials where at least one of the series or shunt electrodes inherently has a higher acoustic impedance than the other).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the electrode materials disclosed by Fujino et al. with the electrode materials disclosed by Bradley. Such a modification would have been obvious where use of a plurality of electrodes materials in a bulk piezoelectric filter

such as shown by Fujino et al. and Bradley is well-known in the art, further where Bradley teaches improving filter characteristics by weighting thickness of electrodes where substitution of the different materials in the shunt and series resonator electrodes having the same thicknesses would provide similar results (col. 13, line 62 and col. 14, lines 40-45), thus suggesting the obviousness of the modification.

Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujino et al. in view of Takeuchi et al. (U.S. Patent No. 7,002,437).

Fujino et al. teaches the branching filter above comprising piezoelectric resonators forming transmitting and receiving filters where piezoelectric resonator of the Rx filter comprises plural isolation layers of SiO2 and Al2O3 (Fig. 16) but does not teach the isolation layer comprising AlN.

Takeuchi et al. teaches a most nearly identical piezoelectric resonators comprising plural isolation layers where isolation layer (3) comprises AlN (3 – col. 9, line 22) or Al2O3 (col. 5, line 45) and layer 1a comprises SiO2 (1a – col. 8, line 60, 61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Tx filter isolation layers disclosed by Fujino et al. with the isolation layers disclosed by Takeuchi et al. Such a modification would have been obvious where the use of plural isolation layers of different materials is well-known and where Takeuchi et al. teaches both alternative isolation layer materials (AlN and Al2O3) for all filters in the branching filter or duplexer (10); where Fujino et al. teaches

only Al2O3 for the Rx filter and AlN for the Tx filter; and where both inventions are by the same Assignee, thus suggesting the obviousness of the modification.

Allowable Subject Matter

Claim 21 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takeuchi et al. '496 – shows a piezoelectric resonator using different electrode materials.

Takeuchi et al. '424 – shows a piezoelectric resonator using a second harmonic.

Tikka et al. – shows tuned electrodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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April 13, 2006

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